

TMWb Software Requirements

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Requirements Described: Select Flights Function
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Revision History

Revision	Date	Authors Initials	Description of the Change
Version 0.4	July 16, 1997	MT	Initial Version
Version 1.1	April 9, 1998	MT	
Version 1.3	March 8, 1999	MT	
Version 1.4	April 10, 2002	MT	Updated to reflect changes made prior to Release 7.5
Version 1.5	May 20, 2002	MT	Updated for Release 7.5

1.0 Overview

This document defines the software specifications for the TSD Select Flights functions.

The purpose of the Select Flights functions are to allow the user to specify which flights are to be shown on the display and the icons that are used to display those flights. Menu options shall be provided that will invoke the Select Flights functions. The select flights commands will also be supported via the Command Line Interface.

The primary Select Flights functions that the TSD shall provide are the following.

- The TSD shall allow the user to specify which flights are to be displayed. This specification shall include: Departure and Arrival locations, NAS Elements Traversed, Airline, Aircraft Type, Equipment Types, Aircraft Category, and Flight Levels.
- The TSD shall allow the user to specify the characteristics of the display of the flights. These characteristics shall include: the icon that is used, color of the icon, whether the data block is shown and its contents, and whether the route, history, lead line and last TZ is drawn.
- The TSD shall allow the user to save and recall these specifications of selected flights.

1.1 Summary of Changes for Release 7.5

The following is a summary of the changes to the Select Flights function that are planned for Release 7.5:

1. The Flight Set Filter dialog box will be modified to include a field for specifying Beacon Codes. The TSD will accept one or more Beacon Code designators in this field. It will accept specific 4-digit Beacon Codes or Beacon Codes that end with the '*' wildcard (any string of characters).

2. The Flight Set Filter dialog box will also be modified to include the option to include only Special Flights in the flight set. The FTM for Release 7.5 will include the function to designate Special Flights by matching their ACID and Origin with the values contained in a user provided input file. The TSD will filter these flights based upon the Special Flights flag in the map file.
3. The Flight Set Filter dialog box will also be modified to accept ACID designators that may end with the '*' wildcard. If the ACID designator doesn't end with the '*' character, the TSD shall limit the selection to flights whose ACID exactly matches the designator. If the ACID designator ends with the '*' wildcard character, the TSD shall limit the selection to flights whose ACID begins with the characters that precede the '*' character in the designator.

2.0 Functional Description

The TSD shall provide the following functions that are described in subsequent sections of this document.

- Select Flights Menu Function
- Select Flight Commands
- Flights Count Function

2.1 Select Flights Menu Function

Overview: The Select Flights menu function shall allow the user to filter the flights that are shown on the TSD display. The flights that are to be shown on the TSD display shall be defined using the concept of flight sets. Each flight set shall be defined by the attributes of the flights that are to be contained in the flight set. These attributes shall include the following:

- Arrival and Destination locations
- Fixes, sectors, ARTCC's and airways traversed along the route of flight
- Airline
- Aircraft and equipment type/remarks
- Flight levels

The flight set definition shall also define the manner in the flights in the set are to be displayed. These display characteristics shall include:

- Icon shape and color
- Data block contents
- Drawing of the routes

Menu command: Under the **Flights** menu item, the second menu option shall be **Select Flights**. The TSD shall also provide the Select Flights menu option in the generic pop up menu.

Functional Description:

When the **Select Flights** menu option is invoked, the Select Flights dialog box shall be displayed. This dialog box, which is described in Section 4.1, shall provide the functions necessary to create and manage the flight sets.

If the user gives the Adapt/Save command, the TSD shall save the current flight selections and the current default settings for the icon and aircraft color.

2.2 Select Flights Commands

Overview: The Select Flights commands shall allow the user to filter the flights that are shown on the TSD display.

Command Line: The TSD shall support the following commands that select the flights to be displayed:

- Select Arrivals (ARR)
- Select Arrivals and Departures (AD)
- Select Data Blocks (SDB)
- Select Departures (DEP)
- Select Flight Group Color (SC)
- Select Flights (SF)
- Select Flights and Color (SFC)
- Aircraft Color (DAC)

2.3 Flight Count Function

Overview: The Flight Count function shall allow the user to display the following information:

- Number of active flights
- Number of active flights in each of the currently shown flight sets
- Number of active flights in each flight set that are visible on the display

The primary purpose of this function is to allow the user to monitor arrival flows into airports.

Menu Command: Under the Flights menu, the third menu option shall be **Show Flight Count** or **Hide Flight Count** depending upon what is relevant at any instant. This menu option shall toggle the display of the Flight Count window. The menu item shall also toggle between **Show Flight Count** and **Hide Flight Count** as appropriate.

Functional Description:

The Show/Hide Flight Count menu option on the Flights menu shall toggle the display of the Flight Count window. Like the Times window, the Flight Count window will typically remain visible on the screen at all times; however the user shall have the option of hiding the window if desired by selecting the menu option.

3.0 Data Interfaces

3.1 Internal Interfaces

The Select Flight function shall provide an internal interface to the Alerts Examine Flights function. The Examine Flights function shall create and define a flight set that will show the flights that contribute to the alert condition for the specified time range.

The Select Flights function shall provide an internal interface to the Command Line Interface functions to support the select flights commands that can be entered via the Command Line Interface.

3.2 External Interfaces

The TSD shall register with the ETMS/FTM process for map and rte files during initialization. This will cause the TSD to automatically receive notification from the ETMS/FTM process (generally every 1-3 minutes) that an new files are available. These files provide the data for all active flights. The TSD shall read and process the flight data files when it is notified that an update is available. The Select Flights function shall define the parameters that determine which of the active flights are to be shown on the display.

4.0 User Interface

The user interface for the Select Flights menu option shall consist of two primary dialog boxes:

Select Flights dialog box
Flight Set Filter dialog box

4.1 Select Flights Dialog Box

The TSD shall display the Select Flights dialog box when the Flights>Select Flights menu option is selected. This dialog box, which is shown in Figure 4.1, will be the primary user interface for defining the flights that are to be displayed by the TSD.

The basic concepts are:

1. Flights that are to be displayed are grouped into sets that are defined by specifying the characteristics of the flights in the set. Each row in the dialog box defines a flight set.
2. The flight set definition also specifies the manner in which the set is to be drawn on the TSD display.
3. Flight sets can be rank ordered. In the event that an individual flight could belong to more than one set, the TSD shall assign the flight to the highest order set to which the flight could belong.
4. Flight sets can be created and deleted.
5. The currently defined flight sets can be saved and recalled at a later time.
6. When a flight set group is recalled, the user shall have the option of replacing the current flight sets or appending the recalled flight set group to the current flight sets.

Select Flights										
File		Flight Set								
	Show	Icon	Color	Arrival	Departure	Data Block	Org Dest	Show Route	Draw Route	Filter
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OK Apply Cancel Help

Figure 4.1 Select Flights Dialog Box

Each row in the dialog box shall define one flight set. The arrival or departure locations are the primary criteria used to define the flights that belong to the set. Hence these fields shall be provided on this dialog box. The text entry fields for specifying lessor used criteria shall be provided on the Select Flights Filter dialog box that is described in the next section. The Select Flights dialog box shall also provide check buttons that will allow the user to define characteristics of the display of the flights in the flight sets.

When the TSD is initialized, the Select Flights function shall be initialized with the flight set definitions contained in the `/top_dir/tsd/adapt/flights/defaults` file.

When the Select Flight dialog box is opened, focus shall be on the Arrival field of the first flight set. The **<TAB>** and **<Shift TAB>** keys shall cause the focus to move from one flight set to the next. The arrow keys shall cause focus to move between fields and check boxes within a flight set. Each action button (OK, Apply, Cancel, and Help) shall also be a tab group so that when the **<TAB>** key is pressed when focus is on the last flight set, the focus shall move to the OK action button. When the **<Tab>** key is subsequently pressed, keyboard focus shall move to the Apply, Cancel, and Help buttons, in that order. If the **<Tab>** key is pressed when focus is on the Help button, focus shall move to the Arrival field of the first flight set.

When the **OK** button is clicked, the TSD shall validate the entries in the Arrival and Departure fields according to the validation criteria specified in Section 4.5. If there are any errors, the TSD shall highlight the entries in the fields that are in error. If there are no errors, the TSD shall update the display to show the flight sets that have their *Show* check button selected. The TSD shall close the dialog box and remember the definition of the flight sets so that when the dialog box is opened again the same flight sets will be defined.

When the **Apply** button is clicked, the TSD shall perform the same functions as with the **OK** button except that the dialog box shall not be closed.

When the **Cancel** button is clicked, the TSD shall close the dialog box and discard any changes to the flight set definitions that have been made since the dialog box was opened or since the **Apply** button was clicked, whichever occurred last. The TSD shall update the display if necessary to reflect the resulting flight set definitions after any changes are discarded.

When the **Help** button is clicked, the TSD shall display the help window showing the help text for the Select Flights dialog box.

The Select Flights dialog box shall support the following basic features:

- Drag and Drop to allow flight sets to be reordered.
- Select one or more flight sets using the left mouse click on the row number.
- Horizontal resizing up to a maximum size which shows all columns.
- Vertical resizing from a minimum of one flight set to a maximum of all flight sets. When the dialog box is resized vertically, only whole rows shall be shown.

Selecting Flight Sets

The user shall be able to select one or more flight sets by clicking the left mouse button on the row number. Clicking the left mouse button on the row number shall cause the row to be selected and all other rows to be deselected. Pressing the **<Ctrl>** key as the left mouse button is clicked on the row

number shall cause the selection state of the row to be toggled; however the selection state of all other rows shall not be changed.

It shall be possible to select a contiguous group of rows in couple of different ways. One way shall be to position the pointer on the row number of the first row in the group, click and hold the left mouse button, drag the pointer to the last row in the group and release the mouse button. Another way shall be to select the first row in the group by clicking the left mouse button on the row number, moving the pointer to the row number of the last row in the group, and pressing the <Shift> key as the left mouse button is clicked. All of the rows between the first and last shall be selected.

Drag and Drop Functions

The Select Flights dialog box shall support drag and drop functions. One use of the drag and drop functions shall be to reorder the flight sets. It shall be possible to move a group of selected flight sets by clicking the holding the middle mouse button and repositioning the pointer to the row number above which the selected rows will be moved. When the middle mouse button is released, the TSD shall move the selected rows to the position(s) directly above the row number being pointed to. During the drag operation, the pointer icon shall change to the drag icon for the move operation. Only the buttons in the row number column shall be valid drop sites. This will enable the user to be able to cancel the drag and drop function by positioning the pointer over a location other than the row number column and releasing the mouse button.

Another use of the drag and drop functions will be to move or copy text from one text field to another. For instance it shall be possible to copy the arrival and destination locations from one flight set into another. This operation shall work as follows. To start the drag function, the user will first select the text to be dragged using the left mouse button. The user will then position the pointer on the text that has been selected and press and hold the middle mouse button. The user will specify whether a move or copy operation is to happen by pressing the appropriate modifier key (described below).

Key	Action
<Shift>	Move. The selected text is moved to the drag site. This shall be the default function if neither the <Ctrl> or <Shift> modifier keys are pressed.
<Ctrl>	Copy. The selected text is copied to the drag site.

While holding the middle mouse button and pressing the modifier key, the user will move the pointer to the desired drop site. The TSD shall change the pointer to the appropriate drag icon as long as the middle mouse button is held. When the middle mouse button is released, the TSD shall perform the move or copy operation on the selected text if the pointer is on a valid drop site. If the drop site is not a valid text field, the TSD shall cancel the drag and drop operation and not perform any copy or move operation.

The table shown below describes the data entry fields in the Select Flights dialog box.

The TSD shall combine multiple entries in a single field with a logical OR operation. The TSD shall combine the entries in multiple fields with a logical AND operation.

Field	Specification
Arrival	The Arrival field shall limit the selection to flights arriving at the listed airport(s) or any airport in the listed ARTCC(s). The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown arrival points and ALL for all arrival points. If no characters are entered in this field, this shall be the same as if ALL had been entered in this field. This text field shall accept as many as 256 characters.

Field	Specification
Departure	The Departure field shall limit the selection to flights departing from the listed airport(s) or any airport in the listed ARTCC(s). The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown departure points and ALL for all departure points. If no characters are entered in this field, this shall be the same as if ALL had been entered in this field. This text field shall accept as many as 256 characters.

These fields shall be initially sized to accept one line of 16 characters without resizing. When additional characters are entered, the field shall expand vertically to accommodate the additional characters. The text shall be word wrapped.

The following table describes the buttons that shall be provided to select display options for each flight set:

Button	Specification
Show	The Show check box that when activated shall designate that the flight set is to be displayed.
Icon	The Icon button shall display a pull down menu that will allow the user to select the icon that will be used to display the flights in the flight set. A symbol representing the selected icon shall be displayed in the button. The default icon shall be specified if none has been selected with the dialog box.
Color	The Color button shall display a color palette dialog box that will allow the user to select the color that will be used to display the flights in the flight set. The selected color shall be displayed in the button. The default color shall be an adaptation parameter that can be changed using the Aircraft Color command (Section 4.5.8).
Data Block	When the Data Block check box is selected, the TSD shall display the data blocks for the flights in the flight set.
Org/Dest	When the Org/Dest check box is selected, the TSD shall display the origin and destination in the data block whenever the data blocks are shown for flights in the flight set. The Org/Dest check box and the Show Route check box shall be mutually exclusive. When the Org/Dest check box is selected, the Show Route check box shall be deselected if it is in a selected state.
Show Route	When the Show Route check box is selected, the TSD shall display the route of flight in the data block whenever the data blocks are shown for flights in the flight set. The Show Route check box and the Org/Dest check box shall be mutually exclusive. When the Show Route check box is selected, the Org/Dest check box shall be deselected if it is in a selected state.
Draw Route	When the Draw Route check box is selected, the TSD shall draw the route of flight on for the flights in the flight set. These routes shall be drawn using the highlight color.
Filter	When the Filter button is selected, the TSD shall display the Flight Set Filter Dialog Box. The Filter button shall provide a visual indication (such as a check box) that one or more filter parameters have been specified. If no filter parameters are specified, the visual indication shall not be displayed.

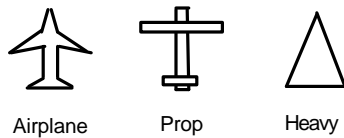
The Icon button shall allow the user to select the icon to be used for displaying flights in the flight set. The following icon options shall be provided:

Icon	Description
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Icon	Description
Dot	A dot of 4 pixels in size shall be used to display the flights if the zoom level is equal to or above the configured level that shall be set to a nominal value of 850. The TSD shall display the flights using the airplane icon when zoom levels are below the configured level.
Airplane	An airplane icon shall be used to display the flights in the flight set. The TSD shall use one of the 16 orientations of the icon that most closely corresponds to the heading of the aircraft. The airplane icon shall be used at all zoom levels.
Automatic	The automatic option shall display one of three different icons depending on the type of aircraft. The TSD shall use the Heavy icon for heavy aircraft types, the prop icon for prop and turbo-prop aircraft types, and the airplane icon for all other aircraft types. These icons shall be used at all zoom levels. The TSD shall use one of the 16 orientations of the icon that most closely corresponds to the heading of the aircraft.

Aircraft Icons:

The following icon shapes shall be used:



These icons shall be drawn using a 9x9 pixel array.

Whenever these icons are being drawn, the TSD shall draw these icons solidly filled in unless the flight is being ghosted in which case the icons shall be drawn in outline form. Note: Any character from “a” through “h” in the symbol field in the Flight Table indicates that the flight is ghosted. (A flight is “ghosted” by the FTM if several position reports are missing. In this case, the position is estimated by the FTM based upon the last known position, heading and speed.)

If the aircraft is holding (as indicated by a “&” character in the symbol field in the flight table), the TSD shall draw the racetrack icon similar to the one shown below instead of the aircraft icons shown above.



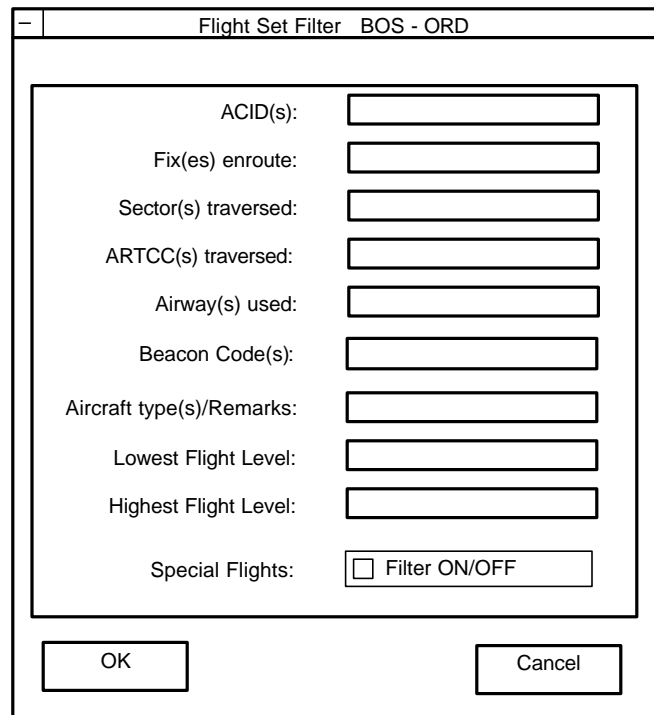
Race Track Icon

4.2 Flight Set Filter Dialog Box

The Flight Set Filter dialog box shall provide the means by which the user can define additional parameters that specify which flights are to be included in the set. This dialog box, which is shown in Figure 4.2, shall be similar to the Select Flights and Color (SFC) semicolon command dialog box in order to provide a consistent look and feel to the users.

When the **OK** button is clicked, the TSD shall save the filter parameters that have been entered and close the dialog box. When the **Cancel** button is clicked, the TSD shall close the dialog box and discard any changes made since the dialog box was opened.

The TSD shall combine multiple entries in a single field with a logical OR operation. The TSD shall combine the entries in multiple fields with a logical AND operation. If no entries are specified in a particular field, the TSD shall not filter on that field



The image shows a dialog box titled "Flight Set Filter BOS - ORD". Inside the dialog, there is a list of filter criteria, each followed by a text input field:

- ACID(s):
- Fix(es) enroute:
- Sector(s) traversed:
- ARTCC(s) traversed:
- Airway(s) used:
- Beacon Code(s):
- Aircraft type(s)/Remarks:
- Lowest Flight Level:
- Highest Flight Level:
- Special Flights: ☐ Filter ON/OFF

At the bottom of the dialog are two buttons: "OK" and "Cancel".

Figure 4.2 Flight Set Filter Dialog Box

The text fields shall be sized to allow one line of 16 characters to be entered without resizing. These fields shall expand vertically as necessary to accommodate all of the text entered. The text in each field shall be word wrapped so that a word is not split between two lines.

The title of the window shall include the first entry in the arrival field followed by the first entry in the departure field. If there are no entries in the arrival or departure fields, the TSD shall substitute the word “ALL” for the arrival or departure location in the window title.

The following table describes the data entry fields in the Flight Set Filter dialog box:

Field	Specification
ACID	The ACID field shall limit the selection to flights with the specified ACID(s). This text field shall accept one or more ACID designators separated by spaces. These ACID designators may end with or without the * (any string of characters) wildcard. If the ACID designator doesn't end with the * character, the TSD shall limit the selection to flights whose ACID exactly matches the designator. If the ACID designator ends with the * wildcard character, the TSD shall limit the selection to flights whose ACID begins with the characters that precede the * character in the designator. The text field shall accept as many as 256 characters.
Fix(es) Enroute	The Fix(es) Enroute field shall limit the selection to flights that traverse any of the listed fixes. This text field shall accept one or more fix designators separated by spaces. This text field shall accept as many as 256 characters.
Sector(s) Traversed	The Sector(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more sector designators separated by spaces. This text field shall accept as many as 256 characters

Field	Specification
ARTCC(s) Traversed	The ARTCC(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more ARTCC designators separated by spaces. This text field shall accept as many as 256 characters.
Airway(s) Used	The Airway(s) Used field shall limit the selection to flights that used any of the listed airways. This text field shall accept one or more airway designators (Jet, Oceanic, or Victor route) separated by spaces. This text field shall accept as many as 256 characters.
Beacon Code(s)	The Beacon Code field shall limit the selection to flights with the specified Beacon Code(s). This text field shall accept one or more Beacon Code designators separated by spaces. These Beacon Code designators may end with or without the * (any string of characters) wildcard. If the Beacon Code designator doesn't end with the * character, the TSD shall limit the selection to flights whose Beacon Code exactly matches the designator. If the Beacon Code designator ends with the * wildcard character, the TSD shall limit the selection to flights whose Beacon Code begins with the characters that precede the * character in the designator. The text field shall accept as many as 256 characters.
Aircraft Type(s)/Remarks	The Aircraft Type(s)/Remarks field shall limit the selection to flights with specific types of aircraft, equipment, and remarks keyword(s). This text field shall accept one or more Aircraft Type designators, equipment prefix and suffix data, and remarks keywords separated by spaces. This text field shall accept as many as 256 characters. The TSD shall process the entries in this field according to the requirements specified in Section 4.2.1.
Lowest Flight Level	The Lowest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes above the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4.
Highest Flight Level	The Highest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes below the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4.
Special Flights	When the Special Flights option is selected, the TSD shall limit the selection to flights that are designated as special flights in the MAP file. (The FTM will identify the special flights based on the list of flights in a data file.)

4.2.1 Requirements for Aircraft Type and Remarks Field

The Aircraft Type/Remarks field limits the selection to flights with specific types of aircraft, equipment, and remarks keyword(s). The entries in this field may consist of one or more words of various types. To specify aircraft types, the user may enter the aircraft type (e.g. B757), the aircraft category (e.g. "J" for Jet), the aircraft class (e.g. "H" for Heavy), or the user category (e.g. "M" for Military). To specify the equipment types, the user may enter the prefix data or suffix data or both. To specify the remarks, the user may enter one or more remarks keywords (e.g. NRP). This section describes the rules that the TSD shall use to interpret the entries in this field.

The entries in this field will consist of one or more words separated by spaces. The TSD shall first determine the type of data represented by each word using the following rules:

1. If the word begins with a “/” or “-/” character(s), then the word shall be an equipment id suffix.
2. Else if the word ends with a “/” character, then the word shall be an equipment id prefix.
3. Else if the word begins with a “[” or “-|” character(s), then the word shall be a remarks keyword.
4. Else if the word consists of one alphabetic character equal to “J”, “T”, or “P, then the word shall be an aircraft category designator.
5. Else if the word consists of one alphabetic character equal to “H”, “L”, or “S, then the word shall be an aircraft class designator.
6. Else if the word consists of one alphabetic character equal to “M” or “C, then the word shall be a user category designator.
7. Else if the word, or the word that follows a “-” character, matches one of the valid Remarks Keywords, then the work shall be a Remarks Keyword. The TSD shall determine valid keywords using the file: /etms/shared/remarks_keywords.
8. Otherwise, the word shall be an aircraft type designator.

The MAP file received from the FTM, contains the remarks keywords in a bit encoded word. The bit position assigned to each keyword is defined in the remarks_keywords file. Bit 0 corresponds to the least significant bit of the remarks word in the MAP file. To select (or exclude) flights with particular keywords, the TSD shall evaluate the bits in the remarks word in the MAP file to determine which remarks keywords are associated with each flight.

The TSD shall combine all of the words specified in the Aircraft Type/ Remarks field to be used to filter the selection of flights using the following rules:

1. All words that are designators for aircraft types, aircraft category, and aircraft class shall be combined using a logical OR.
2. All words that are user categories, equipment prefix, suffix, or remarks keywords shall be combined with the designators from Rule #1 using a logical AND.
3. If an equipment prefix, suffix, or remarks keyword is preceded by a “-“ character, the TSD shall exclude flights that have that prefix, suffix, or remarks keyword from the flight selection.

The following are examples of the application of these rules:

Field Entry	Flight Selection Result
B757 -/B NRP	Select all flights with an aircraft type of B757 that has a remarks keyword of NRP and does not have a suffix of /B.
B747 MD80 /R	Select all flights with aircraft types of either B747 or MD80 which also have a suffix of /R
H M P -T/	Select all heavy and prop military flights without a prefix T/
B727 C - NRP	Select all Civilian B727 flights that do not have an NRP remark

4.3 File Menu for Select Flights Dialog Box

The Select Flights dialog box shall provide a File menu with the following menu options:

Recall
Save
Delete

The purpose of these menu options is to allow the user to save and recall the flight sets that they have defined.

4.3.1 File>Recall Menu Option

When the Recall menu option is selected, the TSD shall display the dialog box shown in Figure 4.3.1:

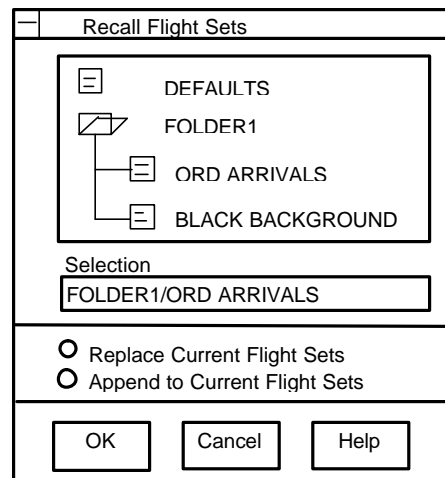


Figure 4.3.1 Recall Flight Sets Dialog Box

This dialog box shall list the files stored in the */top_dir/tsd/adapt/flights* directory and any of its subdirectories. (Note: The directory "top_dir" shall be determined at runtime during the initialization of the TSD.) The TSD shall not allow the user to view higher level directories. The display of the list shall be based upon the XRT Outliner widget which shall allow the user to selectively view the contents of subdirectories by opening or closing the subdirectory folders. When an item in the list is selected, the "Selection" text entry field shall display the file name (along with subdirectory names when appropriate). The Selection field shall accept user input from the keyboard. If the text entered starts with a "/" character, the TSD shall assume that the text is a full path name. If the text entered does not start with a "/" character, the TSD shall assume that the file name (which may include subdirectories) is relative to the */top_dir/tsd/adapt/flights* directory.

If the "Replace" radio button is selected when the **OK** button is clicked, the TSD shall replace the current flight sets with the flights sets defined in the specified file. If the "Append" radio button is selected when the **OK** button is clicked, the TSD shall append the flight sets defined in the file at the bottom of the list of current flight sets. The **Replace** radio button shall be the default whenever this dialog box is opened regardless of the state of these radio buttons when the dialog box was last closed.

If the **Cancel** button is clicked, the TSD shall close the dialog box without changing the current flight sets.

The TSD shall display an error message (See Section 5.0) if the file name specified cannot be found or cannot be accessed when the **OK** button is clicked. In this case, this dialog box shall not be closed so that the user will be able to correct the file name and try again.

When the **OK** button, The TSD shall validate that the file specified is a flights adaptation file. If the TSD detects that the file is not valid or the TSD has problems reading or processing the file, the TSD shall ignore the file and display the error message (specified in Section 5.0).

When a file is recalled and the flight sets are updated, the TSD shall apply these changes to the display.

4.3.2 File>Save Menu Option

When the Save menu option is selected, the TSD shall display the dialog box shown in Figure 4.3.2:

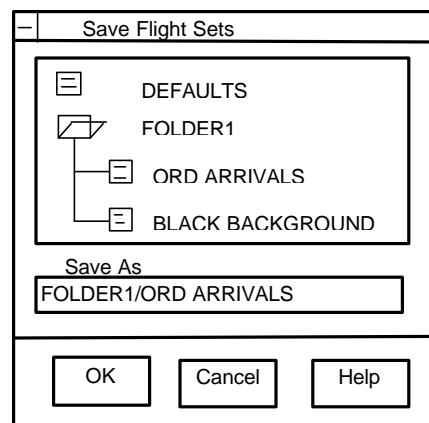


Figure 4.3.2 Save Flight Sets Dialog Box

This dialog box shall list the files stored in the */top_dir/tsd/adapt/flights* directory and any of its subdirectories. (The TSD shall not allow the user to view higher level directories.) The display of the list shall be based upon the XRT Outliner widget. This display shall allow the user to selectively view the contents of subdirectories by opening or closing the subdirectory folders. When an item in the list is selected, the “Save As” text entry field shall display the file name (along with subdirectory names when appropriate). This field shall accept user input from the keyboard. If the text entered starts with a “/” character, the TSD shall assume that the text is a full path name. If the text entered does not start with a “/” character, the TSD shall assume that the file name (which may include subdirectories) is relative to the */top_dir/tsd/adapt/flights* directory. If a sub folder has been selected, the TSD shall fill in the Save As field with the subdirectory name so that the user only has to specify the file name.

When the dialog box is opened, the file name of the current flight set shall be specified in the *Save As* field.

When the **OK** button is clicked, the TSD shall save the currently defined flights sets to the file named in the “Save As” field. If a file of the same name already exists, the TSD shall overwrite the file. The *defaults* file shall be protected so that only someone with superuser permissions can overwrite it. If the TSD encounters problems writing the file, the TSD shall display an error message to the user.

If the **Cancel** button is clicked, the TSD shall close the dialog box without changing the current flight sets.

4.3.3 File>Delete Menu Option

When the Delete menu option is selected, the TSD shall display the dialog box shown in Figure 4.3.3:

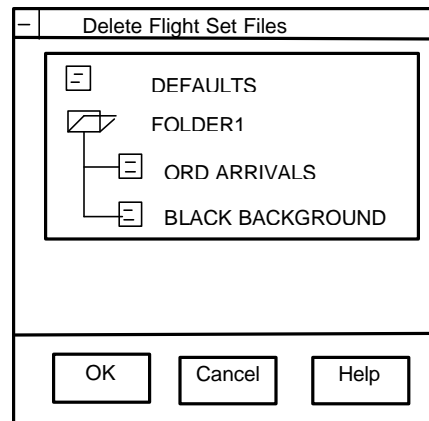


Figure 4.3.3 Delete Flight Sets Dialog Box

This dialog box shall list the files stored in the */top_dirs/tsd/adapt/flights* directory and any of its subdirectories. (The TSD shall not allow the user to view higher level directories.) The display of the list shall be based upon the XRT Outliner widget that shall allow the user to selectively view the contents of subdirectories by opening or closing the subdirectory folders. The TSD shall allow the user to select one or more items in the list. The TSD shall allow the user to select multiple items in the list using the standard shift-click or ctrl-click methods.

The TSD shall allow the user to delete empty folders (subdirectories). However if the user attempts to delete a subdirectory that contains other subdirectories or files, the TSD shall display an error message. (See Section 5.0.)

When the **OK** button is clicked, the TSD shall delete the selected file(s). A confirmation dialog box, shown below, shall be displayed before the delete is performed. If the TSD encounters problems deleting the file, the TSD shall display an error message to the user (See Section 5.0).

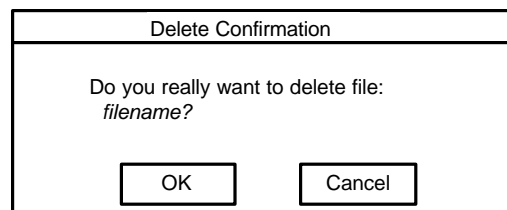


Figure 4.3.4 Delete Confirmation Dialog Box

If the **Cancel** button is clicked or the <Esc> key is pressed, the TSD shall close the dialog box without deleting any files or subdirectories.

4.4 Flight Set Menu Options

The Select Flights dialog box shall have a Flight Set menu with the following options:

- Add
- Copy
- Delete
- Delete All
- Undo Delete
- Top

When the **Add** menu option is selected, the TSD shall add a blank flight set (row) at the top of the current list of flight sets in the Select Flights dialog box. The default aircraft color shall be selected for the color of this flight set. The configurable default icon shall be selected as the icon for the flight set.

When the **Copy** menu option is selected, the TSD shall copy the selected flight sets (rows) and add them to the top of the current list of flight sets. If more than one flight set has been selected, the flight sets shall be copied in the same order as they appear in the selection. The contents of the copied flight sets shall be the same as the current contents of the original flight sets regardless of whether the OK or Apply buttons have been clicked. If no flight sets have been selected, the TSD shall display an error message (See Section 5.0).

When the **Delete** menu option is selected, the TSD shall “delete” the selected flight set row(s). Since one level of undo shall be supported, the TSD shall temporarily store the deleted flight set row(s) so that it could be restored with the Undo Delete menu option. No confirmation message shall be provided since the Undo Delete function will be available to the user. If all rows will be deleted, the TSD shall replace them with a blank flight set as described above for the Add Flight Set function.

When the **Delete All** menu option is selected, the TSD shall delete all flight sets in the table and replace them with one blank flight set as described above for the Add Flight Set function.

When the **Undo Delete** menu option is selected, the TSD shall restore the last flight sets that were deleted and the Undo Delete menu option shall be disabled. In general, these flight sets shall be restored to the same positions in the list as they were when they were deleted and the flight sets shall be selected (highlighted) so that the user can easily identify which flight sets were restored. However whenever an Add or Copy Flight Set operation takes place after flight sets have been deleted, the positions where the flight sets will be restored shall be shifted down in the table by the number of rows that were added by the Add or Copy operation.

When the TSD is started up, the Undo Delete menu option shall be disabled (grayed out). When a flight set has been deleted, the Undo Delete menu option shall be enabled. When the Undo Delete function is executed, the Undo Delete menu option shall be disabled (grayed out).

When the **Top** menu option is selected, the TSD shall move the selected flight set(s) to the top of the list of flight sets. If no flight sets have been selected, the TSD shall display an error message.

4.5 Command Line Interface

The TSD shall provide a command line interface to the Select Flights function. The purpose of this interface is to allow the user to enter the various semicolon commands that can be used to specify the flights to be displayed.

When these commands are issued, the TSD shall create one or more flight sets with the parameters specified in the command line or via prompts. These flight sets shall be added to the top of the list of current flight sets. The Show button for these flight sets shall be turned on.

When these commands are issued, the TSD shall display the Prompt Dialog Box. An example of this dialog box for the Select Arrivals (ARR) command is shown below:

Select Arrivals

Color: blue

Destination(s):

ICON: ☐ Dot ☒ Airplane ☐ Automatic

☒ Replace the current flights being displayed
☐ Add to current flights being displayed

The window shall be movable by dragging the window with the title bar or with the keyboard using the *Move* menu item.

When the window is opened, the first text field shall have keyboard focus. Each field in the main part of the window shall be a tab group. The radio buttons for icons shall be one tab group, the radio buttons for the Replace/Add choice shall be another tab group, and each action button shall be a tab group.

The command name shall be shown in the window title bar.

The text fields shall expand vertically as necessary to accommodate all of the text entered. The text in each field shall be word wrapped so that a word is not split between two lines.

The color selector button shall display the currently selected color. When the dialog box is opened, the currently selected color shall be the color name specified in the command line or the default aircraft color if no color is specified. (The default aircraft color shall be changeable using the Aircraft Color command). If the color name specified in the command line is invalid, the TSD shall display an error message and then open the prompt dialog box using the default aircraft color. When the color selector button is clicked, the TSD shall display the color selector palette that allows the user to select the color to be used for displaying the flight set(s). The name of the color selected shall be shown in “Color:” prompt line.

These dialog boxes shall provide the usual action buttons of OK, Apply, Cancel, and Help. These buttons shall have the normal behavior. When the **OK** button is clicked, the TSD shall invoke the command and close the dialog box. When the **Apply** button is clicked, the TSD shall invoke the command and leave the dialog box visible so that the command can be invoked again. If the **Cancel** button is clicked or the **<Esc>** key is pressed, the TSD shall close the dialog box without invoking the command. If the **Help** button is clicked, the TSD shall display the help window with the appropriate help text file.

4.5.1 Select Arrivals

The purpose of the Select Arrivals command is to allow the user to display the active flights that are scheduled to arrive at the specified airport(s) or ARTCC(s).

Command Syntax: *ARR color airport(s) and/or ARTCC(s)*

The user may enter the command only, the command with the color name, or the command with all of the parameters. If only the command or the command with the color name is entered in the command line, the TSD shall display the prompt dialog box.

Command Result: When the Select Arrivals command is entered, the TSD shall display, in the color specified, those active flights that are scheduled to arrive at the airport(s) specified and/or any airport in the specified ARTCC(s). If the entire command is entered in the command line without prompts, all other flights shall be removed from the display. If the command arguments are entered in the Prompt Dialog Box and the “Replace the current flight sets being displayed” radio button is selected when the OK or Apply buttons are clicked, the TSD shall cease showing any of the current flight sets and only show the flight set(s) created with the command. If the “Add ...” radio button is selected when the OK or Apply buttons are clicked, the TSD shall display the flight set(s) created with the command along with the currently displayed flight sets.

The Select Arrivals command shall automatically show flights if they are not already being displayed.

Icon: The TSD shall use the airplane icon to display the flights selected with the Select Arrivals command unless the user changes the icon choice in the Prompt Dialog Box.

Prompts: If the command is entered without any arguments or with only the “color name” argument, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Arrivals Command Prompts	
Prompt	Specification
Color: <i>color name</i>	The TSD shall provide a color selection button which shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. If the color name is entered in the command line, the TSD shall select the named color when the dialog box is opened otherwise the default aircraft color shall be selected.
Destination(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators, separated by spaces. The TSD shall also accept the entry UNKW for unknown destination points. If “ALL” or no characters are entered in this field, the TSD shall display all flights. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Icon radio buttons:	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.

Select Arrivals Command Prompts	
Prompt	Specification
Replace and Add radio buttons:	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior.

4.5.2 Select Departures

The purpose of the Select Departures command is to allow the user to display the active flights that departed from the specified airport(s) or ARTCC(s).

Command Syntax: *DEP color airport(s) and/or ARTCC(s)*

The user may enter the command only, the command with the color name, or the command with all of the parameters. If only the command or the command with the color name are entered in the command line, the TSD shall display the prompt dialog box.

Command Result: When the Select Departures command is entered, the TSD shall display, in the color specified, those active flights that departed from the airport(s) specified and/or any airport in the specified ARTCC(s). If the entire command is entered in the command line without prompts, all other flights shall be removed from the display. If the command arguments are entered in the Prompt Dialog Box and the "Replace ..." radio button is selected when the OK or Apply buttons are clicked, the TSD shall cease showing any of the current flight sets and only show the flight set(s) created with the command. If the "Add ..." radio button is selected when the OK or Apply buttons are clicked, the TSD shall display the flight set(s) created with the command along with the currently displayed flight sets.

The Select Departures command shall automatically show flights if they are not already being displayed.

Icon: The TSD shall use the aircraft icon to display the flights selected with the Select Departures command unless the user changes the icon choice in the Prompt Dialog Box.

Prompts: If the command is entered without any arguments, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Departures Command Prompts	
Prompt	Specification
Color: <i>color name</i>	The TSD shall provide a color selection button which shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. If the color name is entered in the command line, the TSD shall select the named color when the dialog box is opened otherwise the default aircraft color shall be selected.

Select Departures Command Prompts	
Prompt	Specification
Departure point(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown departure points. If “ALL” or no characters are entered in this field, the TSD shall display all flights. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Replace and Add radio buttons:	The radio buttons, “Replace the current flight sets being displayed” and “Add to current flight sets being displayed” provide the user with the option of continuing to show the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior. If the “Replace ...” button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior.
Icon radio buttons:	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.

4.5.3 Select Arrivals and Departures

The purpose of the Select Arrivals and Departures command is to allow the user to display the active flights that are scheduled to arrive at or have departed from the specified airport(s) or ARTCC(s).

Command Syntax: *AD arrival color departure color airport(s) and/or ARTCC(s)*

The user may enter the command only, the command with the color names, or the command with all of the parameters. If only the command or the command with one or both color names is entered in the command line, the TSD shall display the prompt dialog box.

Command Result: When the Select Arrivals and Departures command is entered, the TSD shall display, in the colors specified, those active flights that are scheduled to arrive at or have departed from the airport(s) specified and/or any airport in the specified ARTCC(s). To display both arrivals and departures from the specified airports (or ARTCCs), the TSD shall create two flight sets: one for arrivals and the other for departures. If the entire command is entered in the command line without prompts, all other flights shall be removed from the display. If the command arguments are entered in the Prompt Dialog Box and the “Replace ...” radio button is selected when the OK or Apply buttons are clicked, the TSD shall cease showing any of the current flight sets and only show the flight set(s) created with the command.

The Select Arrivals and Departures command shall automatically show flights if they are not already being displayed. This command shall create two flight sets – one for arrivals and one for departures.

Icon: The TSD shall use the aircraft icon to display the flights selected with the Select Arrivals and Departures command unless the user changes the icon choice in the Prompt Dialog Box.

Prompts: If the command is entered without any airport or ARTCC arguments, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Arrivals and Departures Command Prompts	
Prompt	Specification
Color for arrivals: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. If one or both color names are entered in the command line, the TSD shall select the first named color for the arrival color when the dialog box is opened otherwise the default aircraft color shall be selected.
Color for departures: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. If both color names are entered in the command line, the TSD shall select the second named color for the departure color when the dialog box is opened otherwise the default aircraft color shall be selected.
Airport(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown arrival or departure points. If "ALL" or no characters are entered in this field, the TSD shall create only one flight set to display all flights in the arrival color. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Icon radio buttons:	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.
Replace and Add radio buttons:	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior.

4.5.4 Select Flights

The purpose of the Select Flights command is to allow the user to display a selected group of active flights. This command is similar to the Select Flights and Color command except the default icon is the dot and the TSD will not accept parameters entered into the command line.

Command Syntax: SELECT FLIGHTS or SF

This command shall ignore any parameters entered in the command line.

Command Result: When the Select Flights command is entered, the TSD shall display, in the color specified, the group of active flights that are selected. As the default, when this command is invoked, the TSD shall cease showing any of the current flight sets and only show the flight set created with this command; however the user shall be able to specify that these flights are to be added to the display of the flights currently being shown.

The Select Flights command shall show flights if they are not already being displayed. (Note this is a change from the ASD.)

Icon: The TSD shall use the dot icon to display the flights that are selected with the Select Flights command unless the user changes the icon selection in the prompt dialog box.

Prompts: When the command is entered, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Flights Command Prompts	
Prompt	Specification
Color for flights: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. When the dialog box is opened, the default aircraft color shall be selected.
Departure point(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown departure point. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight departure point. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Destination(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown destination points. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight destination. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5 . Example: JFK LGA UNKW
Airline(s):	The TSD shall accept one or more airline designators. This text field shall accept one or more airline designators separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Fix(es) en route:	The Fix(es) Enroute field shall limit the selection to flights that traverse any of the listed fixes. This text field shall accept one or more fix designators separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Sector(s) traversed:	The Sector(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more sector designators separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
ARTCC(s) traversed:	The ARTCC(s) Traversed field shall limit the selection to flights that traverse any of the listed centers. This text field shall accept one or more ARTCC designators separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.

Select Flights Command Prompts	
Prompt	Specification
Airway(s) used:	The Airway(s) Used field shall limit the selection to flights that used any of the listed airways. This text field shall accept one or more airway designators (Jet route or Victor route) separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Aircraft type(s)/remarks:	The Aircraft Type(s)/Remarks field shall limit the selection to flights with specific types and categories of aircraft, equipment, and remarks keyword(s). This text field shall accept one or more designators for aircraft type, categories, equipment prefix/suffix data, and remarks keywords separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated and combined into the filter criteria as specified in Section 4.2.1.
Lowest flight level:	The Lowest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes above the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "0". The TSD shall validate the entry in this field against the criteria specified in Section 4.5 and that the prefix is valid.
Highest flight level:	The Highest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes below the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "600". The TSD shall validate the entry in this field against the criteria specified in Section 4.5 and that the prefix is valid.
Icon radio buttons	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the dot icon.
Replace and Add radio buttons	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior.

4.5.5 Select Data Blocks

The purpose of the Select Data Blocks command is to allow the user to display a selected group of active flights with their data blocks.

Command Syntax: SELECT DATA BLOCKS or SDB

This command shall ignore any parameters entered in the command line.

Command Result: When the Select Data Blocks command is entered, the TSD shall display the group of active flights that are selected with their data blocks. As a default, the TSD shall continue showing all flights that are currently being shown on the display; however the user shall be able to specify that the flights are to replace the flights currently being displayed.

The Select Data Blocks command shall not turn on the display of flights if they are not already being displayed.

Prompts: When the command is entered, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Data Blocks Command Prompts	
Prompt	Specification
Color for flights: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt. When the dialog box is opened, the default aircraft color shall be selected.
Departure point(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown departure point. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight departure point. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Destination(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown destination points. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight destination. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Airline(s):	The TSD shall accept one or more airline designators. This text field shall accept one or more airline designators separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Fix(es) en route:	The Fix(es) Enroute field shall limit the selection to flights that traverse any of the listed fixes. This text field shall accept one or more fix designators separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Sector(s) traversed:	The Sector(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more sector designators separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
ARTCC(s) traversed:	The ARTCC(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more ARTCC designators separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.

Select Data Blocks Command Prompts	
Prompt	Specification
Airway(s) used:	The Airway(s) Used field shall limit the selection to flights that used any of the listed airways. This text field shall accept one or more airway designators (Jet route or Victor route) separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Aircraft type(s)/remarks:	The Aircraft Type(s)/Remarks field shall limit the selection to flights with specific types of aircraft, equipment, and remarks keyword(s). This text field shall accept one or more designators for aircraft type, equipment prefix/suffix data, and remarks keywords separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated and combined into the filter criteria as specified in Section 4.2.1.
Lowest flight level:	The Lowest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes above the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry shall be allowed in this field. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "0". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.
Highest flight level:	The Highest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes below the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry shall be allowed in this field. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "600". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.
Icon radio buttons	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.
Replace and Add radio buttons	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to add to the current flight sets since that conforms to the ASD behavior.

4.5.6 Select Flight Group Color

The purpose of the Select Flight Group Color command is to allow the user to display a selected group of active flights and to specify the color of the icon for those flights. This command is similar to the Select Flights and Color command except that when this command is issued, the default behavior is that all other flights currently being displayed shall continue to be displayed.

Command Syntax: `SELECT COLOR` *color name* or `SC` *color name*

This command shall ignore any parameters entered in the command line except for the name of the color which is an optional entry.

Command Result: When the Select Flight Group Color command is entered, the TSD shall display, in the color specified, the group of active flights that are selected. If the name of the color is specified, the TSD shall use that color in the prompt dialog box.

As the default, the TSD shall continue showing any other flights that are currently being shown when the command is invoked; however the user shall be able to specify that the flights are to be added to the flights currently being displayed.

The Select Flight Group Color command shall show flights if they are not already being displayed. (Note that this is different from the ASD.)

Prompts: When the command is entered, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Flight Group Color Command Prompts	
Prompt	Specification
Color for flights: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt.
Departure point(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown departure point. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight departure point. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Destination(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators separated by spaces. The TSD shall also accept the entry UNKW for unknown destination points. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight destination. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Airline(s):	The Airline field shall limit the selection to flights of the specified airlines. This field shall accept one or more airline designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: UAL DAL
Fix(es) en route:	The Fix(es) Enroute field shall limit the selection to flights that traverse any of the listed fixes. This text field shall accept one or more fix designators separated by spaces. The field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.

Select Flight Group Color Command Prompts	
Prompt	Specification
Sector(s) traversed:	The Sector(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more sector designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
ARTCC(s) traversed:	The ARTCC(s) Traversed field shall limit the selection to flights that traverse any of the listed centers. This text field shall accept one or more ARTCC designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Airway(s) used:	The Airway(s) Used field shall limit the selection to flights that use any of the listed airways. This text field shall accept one or more airway designators (Jet route or Victor route) separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Aircraft type(s)/remarks:	The Aircraft Type(s)/Remarks field shall limit the selection to flights with specific types of aircraft, equipment, and remarks keyword(s). This text field shall accept one or more designators for aircraft type, equipment prefix/suffix data, and remarks keywords separated by spaces. This field shall accept as many as 256 characters. The entries in this field shall be validated and combined into the filter criteria as specified in Section 4.2.1.
Lowest flight level:	The Lowest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes above the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry shall be allowed in this field. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "0". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.
Highest flight level:	The Highest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes below the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry shall be allowed in this field. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "600". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.
Icon radio buttons	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.
Replace and Add radio buttons	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to add to the current flight sets since that conforms to the ASD behavior.

4.5.7 Select Flights and Color

The purpose of the Select Flights and Color command is to allow the user to display a selected group of active flights. This command is similar to the Select Flight Group Color except the default condition is that when this command is issued, all non-selected flights are removed from the display. This command is also similar to the Select Flights command except the default icon is the airplane and the TSD will accept the color name entered into the command line.

Command Syntax: SELECT FLIGHTS AND COLOR *color name* or SFC *color name*

This command shall ignore any parameters entered in the command line except for the name of the color which is an optional entry.

Command Result: When the Select Flights And Color command is entered, the TSD shall display, in the color specified, the group of active flights that are selected. As the default, when this command is invoked, the TSD shall cease showing any of the current flight sets and only show the flight set created with this command; however the user shall be able to specify that these flights are to be added to the display of the flights currently being shown.

The Select Flights And Color command shall show flights if they are not already being displayed. (Note that this is a change from the ASD.)

Icon: The TSD shall use the airplane icon to display the flights that are selected with the Select Flights and Color command unless the user changes the icon selection in the prompt dialog box.

Prompts: When the command is entered, the TSD shall display the Prompt Dialog Box for this command. The prompt fields that shall be included in the dialog box are listed in the table below.

Select Flights And Color Command Prompts	
Prompt	Specification
Color for flights: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt.
Departure point(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators, separated by spaces. The TSD shall also accept the entry UNKW for unknown departure point. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight departure point. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW
Destination(s):	The TSD shall accept one or more airport designators and/or one or more ARTCC designators, separated by spaces. The TSD shall also accept the entry UNKW for unknown destination points. If "ALL" or no characters are entered in this field, the TSD shall not filter on the flight destination. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: JFK LGA UNKW

Select Flights And Color Command Prompts	
Prompt	Specification
Airline(s):	The Airlines field shall limit the selection to flights of the specified airlines. The TSD shall accept one or more airline designators, separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5. Example: UAL DAL
Fix(es) en route:	The Fix(es) Enroute field shall limit the selection to flights that traverse any of the listed fixes. This text field shall accept one or more fix designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Sector(s) traversed:	The Sector(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more sector designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
ARTCC(s) traversed:	The ARTCC(s) Traversed field shall limit the selection to flights that traverse any of the listed sectors. This text field shall accept one or more ARTCC designators separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Airway(s) used:	The Airway(s) Used field shall limit the selection to flights that used any of the listed airways. This text field shall accept one or more airway designators (Jet route or Victor route) separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated against the criteria specified in Section 4.5.
Aircraft type(s)/remarks:	The Aircraft Type(s)/Remarks field shall limit the selection to flights with specific types of aircraft, equipment, and remarks keyword(s). This text field shall accept one or more designators for aircraft type, equipment prefix/suffix data, and remarks separated by spaces. This text field shall accept as many as 256 characters. The entries in this field shall be validated and combined into the filter criteria as specified in Section 4.2.1.
Lowest flight level:	The Lowest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes above the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "0". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.

Select Flights And Color Command Prompts	
Prompt	Specification
Highest flight level:	The Highest Flight Level field shall limit the selection to flights with current filed (F), reported (R), or both (B) filed and reported altitudes below the specified altitude. This field shall accept the flight altitude specified in hundreds of feet with the F, B, or R prefix. (e.g. F350) The default shall be the reported (R) altitude if the prefix is not specified. Only one entry in this field shall be allowed. The TSD shall limit the number of characters entered in this field to 4. The default value for this field shall be "600". The TSD shall validate that the flight level entered in this field satisfies the criteria specified in Section 4.5 and that the prefix is valid.
Icon radio buttons	The TSD shall provide radio buttons for the three choices of icons. The default icon selection shall be the airplane icon.
Replace and Add radio buttons	The radio buttons, "Replace the current flight sets being displayed" and "Add to current flight sets being displayed" provide the user with the option of continuing to show the current flight sets. If the "Replace ..." button is selected when the command is invoked, the TSD shall cease to show any of the current flight sets. The default shall be to replace the current flight sets since that conforms to the ASD behavior.

4.5.8 Aircraft Color

The purpose of the Aircraft Color command is to allow the user to change the default color of flight icons. This command shall also be used to change the default icon that is selected when new flight sets are created.

Command Syntax: DEFAULT AIRCRAFT COLOR *color name* or DAC *color name*

Command Result: When the Aircraft Color command is entered, the TSD shall change the default icon for new flight sets and the default color that is used for displaying flights with the Select Flights Command. The default color that is set through this command shall also be used as the default color for new flight sets and as the default color for the Prompt Dialog Boxes for the all of the select flight commands.

Prompts: When the command is entered without a valid color name, the TSD shall display the Prompt Dialog Box for this command. The prompt field for the color selection shall be included in the dialog box. When the OK or Apply button on the Prompt Dialog box is clicked, the TSD shall change the default color, used to display flights selected with the Select Flights command, to the color selected. The TSD shall also change the default icon for new flight sets to the icon selected.

Aircraft Color Command Prompts	
Prompt	Specification
Color for flights: <i>color name</i>	The TSD shall provide a color selection button that shall display the color selection palette from which the user can select one of 30 colors. When the user clicks on one of the color buttons, the palette shall close, the selected color shall be displayed in the color selection button and the name of the selected color shall be displayed in the prompt.
Icon radio buttons	The TSD shall provide radio buttons for the three choices of icons. The TSD shall use the icon selected as the default icon for new flight sets

	added in the Select Flights dialog box. The initial selection shall be the airplane icon.
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4.6 Flight Count Window

The TSD shall provide a Show/Hide Flight Count menu option on the Flights menu. This menu option shall toggle between the Show Flight Count and Hide Flight Count states. When the Flights>Show Flight Count menu option is toggled on, the TSD shall display the Flight Count window which is shown in Figure 4.6.1.

Flight Count			
Arr	Dep	Actv	Visib
ALL	ALL	4826	51
BOS+	ORD+	55	20
SFO+	DFW	12	8
LAX	ALL	145	23

Figure 4.6.1 Flight Count Window

When the Flight Count window is shown for the first time after the TSD is started, the TSD shall display the window at a configurable position relative to the upper right corner of the TSD display window. The TSD shall allow the user to use the title bar to drag the window to anywhere on the display screen. When the user hides the window, the TSD shall remember the last position and the size of the window and shall restore it to that position and size if the window is subsequently shown.

The window control menu shall provide the Move and Close options. No other options shall be provided on window control menu. If the Close option is selected, the TSD shall change the Hide Flight Count menu option to Show Flight Count.

The window shall consist of four columns to display the Arrival Location, Departure Location, Active flights, and Visible flights. The first row shall display the total number of active flights and the total number of flights that are visible. This row shall always be shown in the window. The subsequent rows shall list each flight set that is currently being shown. For each flight set, the window shall display the arrival airport(s) or ARTCC(s) and the departure airport(s) or ARTCC(s) that are specified in the Select Flights dialog box for that flight set. For each flight set, the TSD shall list the number of active flights that satisfy the flight set criteria and the number of those flights that are currently shown on the display.

Except for the first row, the background color of each cell shall be the same as the TSD background color. The text for each flight set shall be shown in the same color as its display icon. The background color for the first row shall be white and the text in the cells in the first row (all active flights) shall be black.

The text in the first two columns shall be left justified. The numbers in columns 3 & 4 shall be right justified. The text for the column headers shall be a proportional font. The text for all other cells shall be a fix pitch font so that the characters line up.

Since the user may wish to keep the Flight Count dialog box visible at all times, the dialog box should be as small as possible without sacrificing readability. The standard width of each cell shall be sized to allow for 5 characters. If necessary the column headers may be abbreviated to: Arr., Dep., Actv., Visib. However the preference is to not abbreviate them.

The Flight Count dialog box shall not be resizable using window resizing handles and hence, the dialog box shall not support scroll bars. However the TSD shall allow the window to be resized using the row and column resizing features of the XRT Table widget.

The TSD shall display only the first arrival and departure airports (or ARTCCs) that are listed in the corresponding flight set definition field in the Select Flights dialog box. If more than one airport (or ARTCC) designator is listed in the flight set definition for the arrival (or departure) location, the TSD shall append a plus sign character “+” to the location designator. (e.g. BOS+). If no locations are specified in the arrival or departure fields in the flight set definition, the TSD shall list “ALL” as the location in the Flights Count window.

The TSD shall update this window when any of the following events occur:

- A flight update occurs as the result of receiving a new “map” file from the FTM.
- The user changes the flight set definitions or changes which flight sets are shown.
- A Move/Zoom or Projection command changes the viewing area, which may change the number of flights that are visible on the screen.

The standard height of the window shall be sized to allow for a configurable number of lines. A scroll bar shall be provided if the data for all flight sets cannot be shown at the same time. The window shall not be resizable.

The Adapt>Save function shall save the state of whether the flight count window is being shown.

5.0 Error Handling

This section describes the error messages that shall be displayed by the TSD. These error message shall be displayed in Error Message dialog box as shown in Figure 5.1

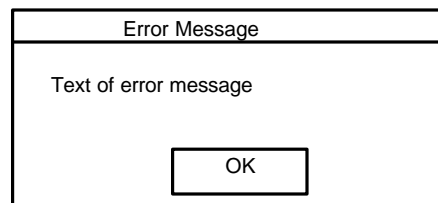


Figure 5.1 Error Message Dialog Box

When this dialog box is opened, keyboard focus shall be on the **OK** button so that pressing <Return> will close the dialog box. The pointer shall be on the **OK** button so that a mouse click will close the dialog box. The <Esc> key shall also close the dialog box.

The following error messages shall be displayed:

1. In the File>Recall function, the TSD shall display the following error message if the file name specified cannot be found or cannot be accessed when the **OK** button is clicked.

File Cannot Be Found or Accessed

2. When a flight set file is being recalled, the TSD shall validate that the file specified is a flights adaptation file. If the TSD detects that the file is not valid or the TSD has problems reading or processing the file, the TSD shall ignore the file and display the error message:

Invalid File

3. If the TSD encounters problems deleting a file or attempts to delete a subdirectory that is not empty, the TSD shall display the error message:

File Cannot Be Deleted

4. If the Flight Set> Copy or the Flight Set>Top menu option is invoked and no flight sets have been selected, the TSD shall display the following error message:

No Flight Set Has Been Selected

5. If the TSD detects an error when validating the entries in the fields in the Select Flights dialog box or the Flight Set Filter dialog box, the TSD shall highlight the entries in the field that are in error and the TSD shall display the following error message:

Invalid Entry

6. The TSD shall validate the color names entered in the command line. If the color name entry does not match any of the valid color names, the TSD shall substitute the default aircraft color for the color name and display the following message:

Invalid Color Name

6.0 Implementation Issues/Suggestions

None at this time.

APPENDIX A Airport Designator Conversion

Many airports in the US have two designators: a US designator which can be 3, 4, or 5 characters in length and an international designator of 4 or 5 characters which begins with the letter “K” followed by the US designator (e.g. KORD and ORD). It is a requirement that the user be able to enter either one of the designators for the arrival and departure locations for flight sets and that the TSD shall include all flights in the set whose arrival or departure locations match either of the designators. For example, if the user enters KORD (or ORD) in the arrival field of a flight set, the TSD shall include all flights whose arrival location is specified as KORD or ORD.

This appendix describes the logic to be applied to the entries in the Arrival or Destination fields in the Select Flights dialog box or in the Departure Points, Destinations, or Airports fields in the prompt dialog boxes for the flight semi-colon commands.

1. For 3 character entries, the TSD shall include in the flight set all flights whose arrival or destination location (as appropriate) matches the character string entered or matches the character string composed of the letter “K” concatenated with the characters entered.
2. For 4 character entries that do not begin with the letter “K”, the TSD shall include in the flight set all flights whose arrival or destination location (as appropriate) matches the character string entered or matches the character string composed of the letter “K” concatenated with the characters entered.
3. For 4 or 5 character entries that begin with the letter “K”, the TSD shall include in the flight set all flights whose arrival or destination airport location (as appropriate) matches the character string entered or matches the character string that follows the letter “K”.